

Claims

We claim:

- 1 1. A method for recognizing hand gestures, comprising:
 - 2 measuring an intensity of a signal at a plurality of touch sensitive pads of a
 - 3 touch sensitive surface;
 - 4 determining a number of regions of contiguous pads touched simultaneously
 - 5 from the intensities of the signals;
 - 6 determining an area of each region from the intensities; and
 - 7 selecting a particular gesture according to the number of regions touched and
 - 8 the area of each region.
- 1 2. The method of claim 1, in which each pad is an antenna, and the signal intensity
- 2 measures a capacitive coupling between the antenna and a user performing the
- 3 touching.
- 1 3. The method of claim 1, in which the regions are touched simultaneously by a
- 2 single user.
- 1 4. The method of claim 1, in which the regions are touched simultaneously by
- 2 multiple users to indicate multiple gestures.
- 1 5. The method of claim 1, further comprising:
 - 2 determining a total signal intensity for each region.

- 1 6. The method of claim 1, in which the total signal intensity is related to an amount
2 of pressure associated with the touching.
- 1 7. The method of claim 1, in which the measuring is performed at a predetermined
2 frame rate.
- 1 8. The method of claim 1, further comprising:
2 displaying a bounding perimeter corresponding to each region touched.
- 1 9. The method of claim 1, in which the perimeter is a rectangle.
- 1 10. The method of claim 1, in which the perimeter is a circle.
- 1 11. The method of claim 1, further comprising:
2 determining a trajectory of each touched regions over time.
- 1 12. The method of claim 11, further comprising:
2 classifying the gesture according to the trajectories.
- 1 13. The method of claim 11, in which the trajectory indicates a change in area size
2 over time.
- 1 13. The method of claim 11, in which the trajectory indicates a change in total
2 signal intensity for each area over time.
- 1 14. The method of claim 13, further comprising:
2 determining as rate of change of area size.

- 1 15. The method of claim 11, further comprising:
2 determining a speed of movement of each region from the trajectory.
- 1 16. The method of claim 15, further comprising:
2 determining a rate of change of speed of movement of each region.
- 1 17. The method of claim 8, in which the bounding perimeter corresponding to an
2 area of region touched.
- 1 18. The method of claim 8, in which the bounding perimeter corresponding to a
2 total signal intensity of the region touched.
- 1 19. The method of claim 1, in which the particular gesture is selected from the
2 group consisting of one finger, two fingers, more than two fingers, one hand and
3 two hands.
- 1 20. The method of claim 1, in which the particular gesture is used to manipulate a
2 document displayed on the touch sensitive surface.
- 1 21. The method of claim 1, further comprising:
2 displaying a document on the touch surface;
3 annotating the document with annotations using one finger while pointing at
4 the document with two fingers.

1 22. The method of claim 21, further comprising:
2 erasing the annotations by wiping an open hand back and forth across the
3 annotations.

1 23. The method of claim 22, further comprising:
2 displaying a circle to indicate an extent of the erasing.

1 24. The method of claim 1, further comprising:
2 displaying a document on the touch surface;
3 defining a selection box on the document by pointing at the document with
4 more than two fingers.

1 25. The method of claim 1, further comprising:
2 displaying a plurality of document on the touch surface;
3 gathering the plurality of documents into a displayed by placing two hands
4 around the documents, and moving the two hands towards each other.

1 26. The method of claim 1, further comprising:
2 determining a location of each region.

1 27. The method of claim 26, in which the location is a center of the region.

1 28. The method of claim 26, in which the location is median of the intensities in
2 the region.